

To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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NPN SILICON RF TRANSISTOR
2SC5185

NPN EPITAXIAL SILICON RF TRANSISTOR
 FOR HIGH-FREQUENCY LOW-NOISE AMPLIFICATION
 4-PIN SUPER MINIMOLD

FEATURES

- Low Noise
 NF = 1.3 dB TYP. @ $V_{CE} = 2\text{ V}$, $I_c = 3\text{ mA}$, $f = 2\text{ GHz}$
 NF = 1.3 dB TYP. @ $V_{CE} = 1\text{ V}$, $I_c = 3\text{ mA}$, $f = 2\text{ GHz}$
- 4-pin super minimold Package

★ **ORDERING INFORMATION**

Part Number	Quantity	Supplying Form
2SC5185	50 pcs (Non reel)	• 8 mm wide embossed taping • Pin 3 (Base), Pin 4 (Emitter) face to perforation side of the tape
2SC5185-T1	3 kpcs/reel	

Remark To order evaluation samples, contact your nearby sales office.
 The unit sample quantity is 50 pcs.

ABSOLUTE MAXIMUM RATINGS ($T_A = +25^\circ\text{C}$)

Parameter	Symbol	Ratings	Unit
Collector to Base Voltage	V_{CBO}	5	V
Collector to Emitter Voltage	V_{CEO}	3	V
Emitter to Base Voltage	V_{EBO}	2	V
Collector Current	I_c	30	mA
Total Power Dissipation	P_{tot}^{Note}	90	mW
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-65 to +150	$^\circ\text{C}$

Note Free air

Caution Observe precautions when handling because these devices are sensitive to electrostatic discharge.

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 Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

ELECTRICAL CHARACTERISTICS (T_A = +25°C)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
DC Characteristics						
Collector Cut-off Current	I _{CBO}	V _{CB} = 5 V, I _E = 0 mA	–	–	100	nA
Emitter Cut-off Current	I _{EBO}	V _{EB} = 1 V, I _C = 0 mA	–	–	100	nA
DC Current Gain	h _{FE} ^{Note 1}	V _{CE} = 2 V, I _C = 20 mA	70	–	140	–
RF Characteristics						
Gain Bandwidth Product (1)	f _T	V _{CE} = 2 V, I _C = 20 mA, f = 2.0 GHz	10	13	–	GHz
Gain Bandwidth Product (2)	f _T	V _{CE} = 1 V, I _C = 10 mA, f = 2.0 GHz	8.0	11	–	GHz
Insertion Power Gain (1)	S _{21e} ²	V _{CE} = 2 V, I _C = 20 mA, f = 2.0 GHz	8.0	11	–	dB
Insertion Power Gain (2)	S _{21e} ²	V _{CE} = 1 V, I _C = 10 mA, f = 2.0 GHz	7.5	9.0	–	dB
Noise Figure (1)	NF	V _{CE} = 2 V, I _C = 3 mA, f = 2.0 GHz	–	1.3	2.0	dB
Noise Figure (2)	NF	V _{CE} = 1 V, I _C = 3 mA, f = 2.0 GHz	–	1.3	2.0	dB
Reverse Transfer Capacitance	C _{re} ^{Note 2}	V _{CB} = 2 V, I _E = 0 mA, f = 1.0 MHz	–	0.3	0.6	pF

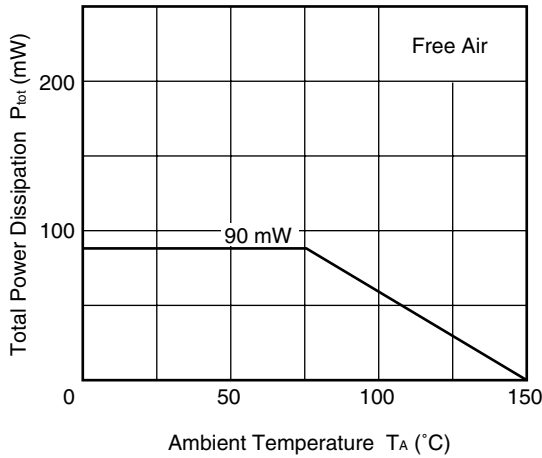
- Notes 1.** Pulse measurement: PW ≤ 350 μs, Duty Cycle ≤ 2%
2. Collector to base capacitance when the emitter grounded

h_{FE} CLASSIFICATION

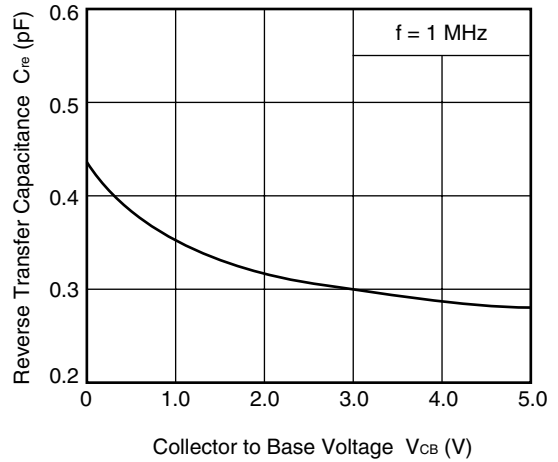
Rank	FB
Marking	T86
h _{FE} Value	70 to 140

TYPICAL CHARACTERISTICS (T_A = +25°C, unless otherwise specified)

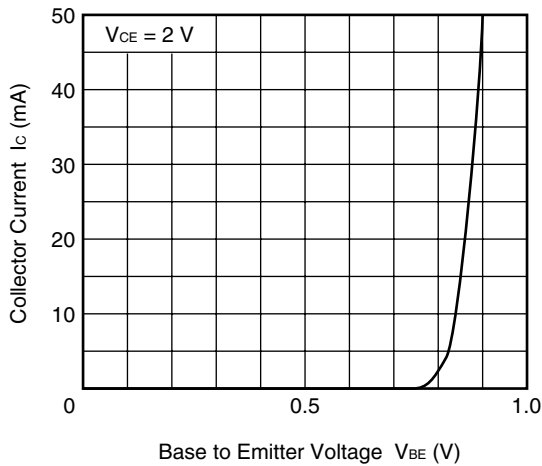
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



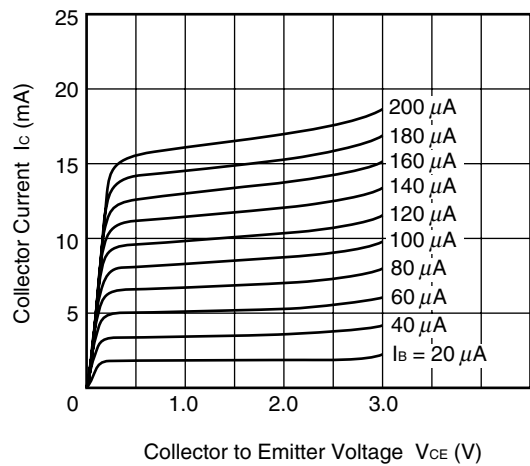
REVERSE TRANSFER CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



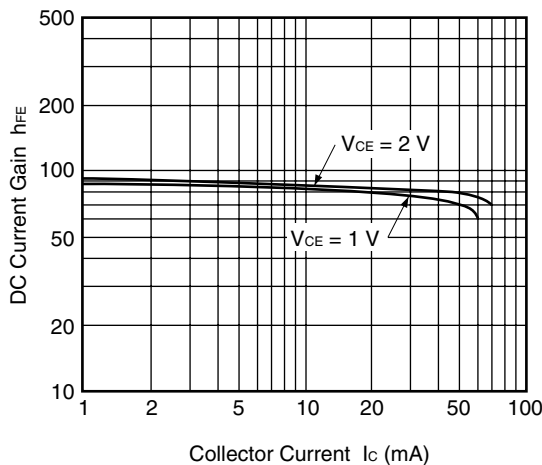
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



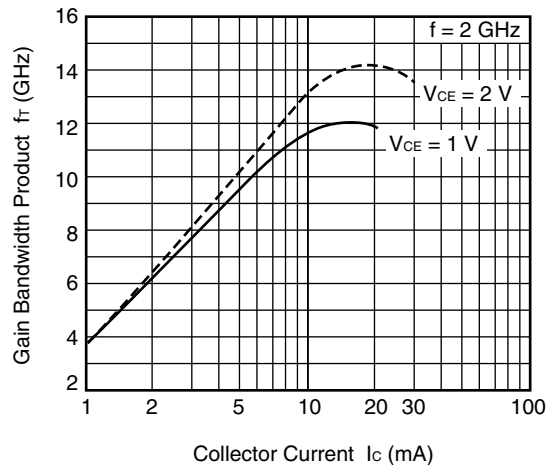
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



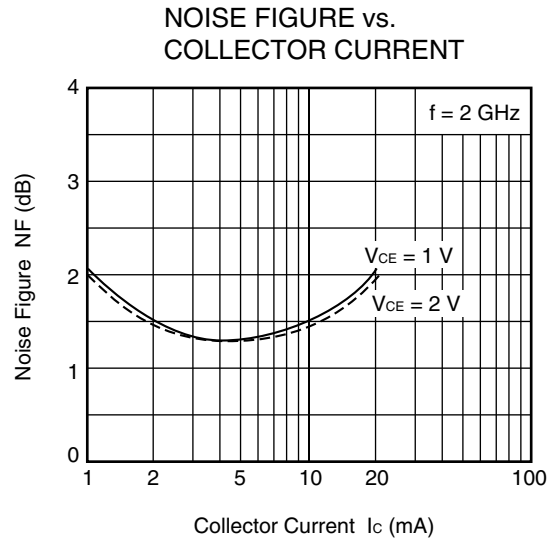
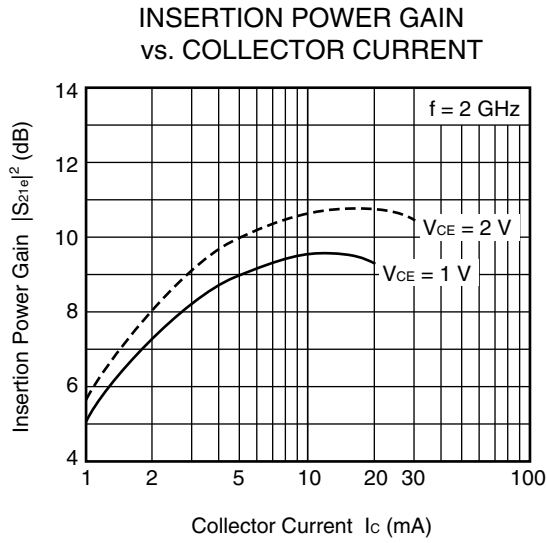
DC CURRENT GAIN vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



Remark The graphs indicate nominal characteristics.



Remark The graphs indicate nominal characteristics.

★ **S-PARAMETERS**

S-parameters/Noise parameters are provided on the NEC Compound Semiconductor Devices Web site in a form (S2P) that enables direct import to a microwave circuit simulator without keyboard input.

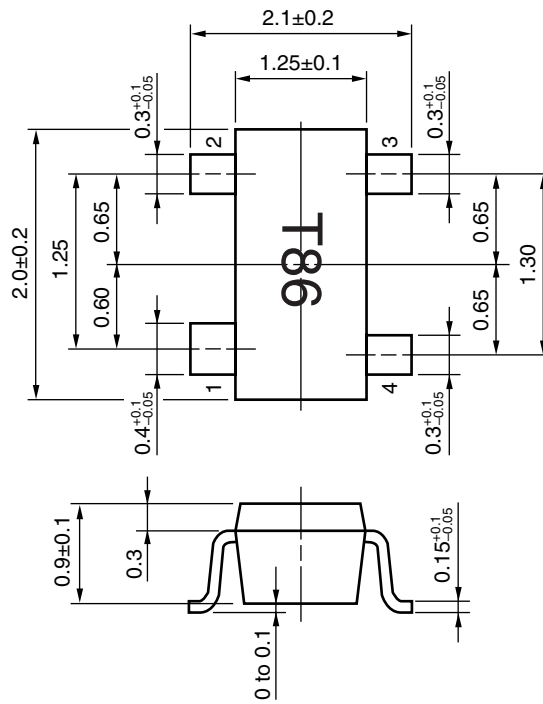
Click here to download S-parameters.

[RF and Microwave] → [Device Parameters]

URL <http://www.ncsd.necel.com/>

★ PACKAGE DIMENSIONS

4-PIN SUPER MINIMOLD (UNIT: mm)



PIN CONNECTIONS

- 1. Collector
- 2. Emitter
- 3. Base
- 4. Emitter

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